Electronic Version
Stylesheet Version v1.1.1

Claims

[c1] What is claimed is:
An ultrasonic scanning apparatus wherein:
the three-dimensional displacement vector of a backscatterer is estimated from the backscatter from partially overlapping beams cross-correlated in multiple cross-correlators instantiated in a field programmable gate array or application specific integrated circuit.

[c2] The apparatus of claim 1, wherein:
the cross-correlation is formed by an algorithm wherein the elements (data points) of the kernel in one beam are used with the by the elements (data points) from the kernel in a second beam in such a fashion that both kernels are not shifted over each other but are shifted together on each clock pulse.

[c3] The apparatus of claim 2, wherein:
multiple cross-correlation sub-results are attained by a plurality of beam pairs.

[c4] The apparatus of claim 3, wherein:
26 cross-correlation sub-results are attained from one acoustic transmission with nine simultaneous, adjacent

in three-dimensions, receive breams to estimate the flow of the backscatterers in three dimensions.